NortelNetworksInventionDisclosure

TrackingNo:_____

Date: September28,2000

Title: Methodforcentralcontrolofmultipleaddressdomainswithinarouter.

NortelNetworksProduct:
OPTeraPacketCore,V25k

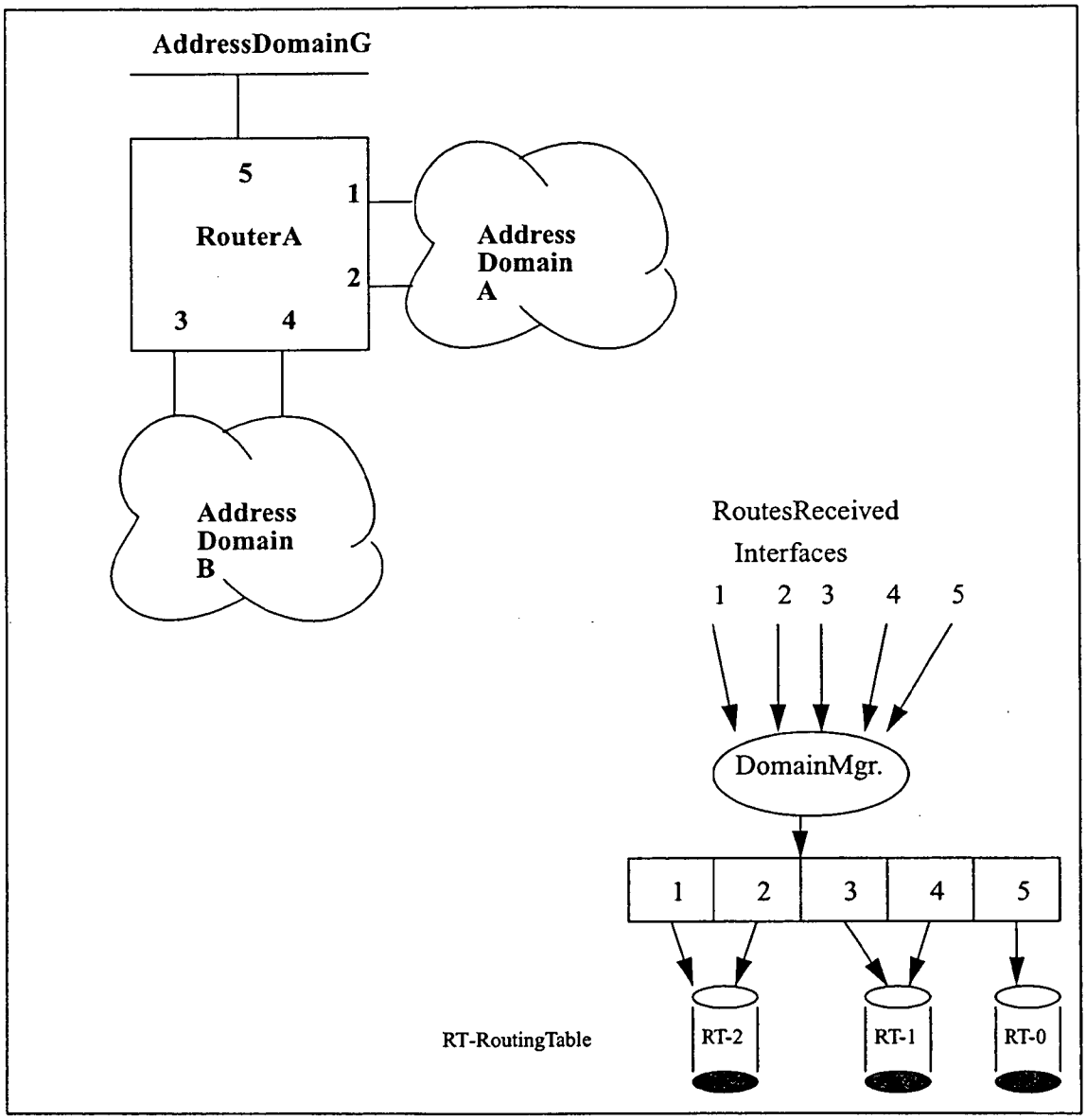
Inventor(s):
JanetDoong,RichardCrump

Description:

The present invention, called Domain Manager, enables a router to efficiently connect to multiple address domains. Each interface belongs to an address domain. Interfaces belonging to the same address domain are able to exchange routes. Address domains operate independently from each other and may contain duplicate or overlapping network addresses. For the traditional router, all its interfaces are treated as one address domain and no duplicate or overlapping network addressesareallowed.

The Domain Manager provides the logic to associate the router's many interfaces to one of many address domain specific routing tables. Network administrator needs to configure the address domain of each the router's interfaces. Domain Manager will create an array, size of the number of interfaces and indexed interface number. Each array element holds memory address which points to the domain specific routing table corresponding to the interface's address domain. If some interfaces are configured belonging to the same address domain then their corresponding arrayelementwillpointtothesamedomainroutingtable.

Read and Understood: _____ **Print Signer's Name:**_____ **Date:**_____



In the above figure, Router A has five interfaces and they are configured for three different address domains, Domain A with interface 1 and 2, Domain B with interface 3 and 4 and one globalnetwork access, interface 5. All the routes received from each interface will be submitted to Domain Manager along with their received interface numbers. Domain Manager will dispatch these routes to their domain specific routing tables through the mapping array. All the global routes received by interface 5 will be dispatched into RT-0. The routes received from interface 1 and 2 belonging to Domain A address space will be dispatched into RT-2. The routes received frominterface3and4belongingtoDomainBaddressspacewillbedispatchedintoRT-1.

Read and Understood: _____ **Print Signer's Name:**_____ **Date:**_____

Unique/PatentableFeatures:

The current invention, Domain Manager, provides a central control logic for routers so routers have ability to handle and propagate routes received from many different address domains. The logic also provides very efficient logic to associate interfaces with address domain specific routing tables. This allows the router to scale well, enabling it to support a large number of differentaddressdomains.

PriorArt:

Attachment1:TraditionalRouter.
Attachment2:VirtualRouter.

UseinStandards/OtherPlannedDisclosures:

none.

Attachments:

Attachment1:TraditionalRouter.
Attachment2:VirtualRouter.
Attachment3:RouterwithDomainManager.

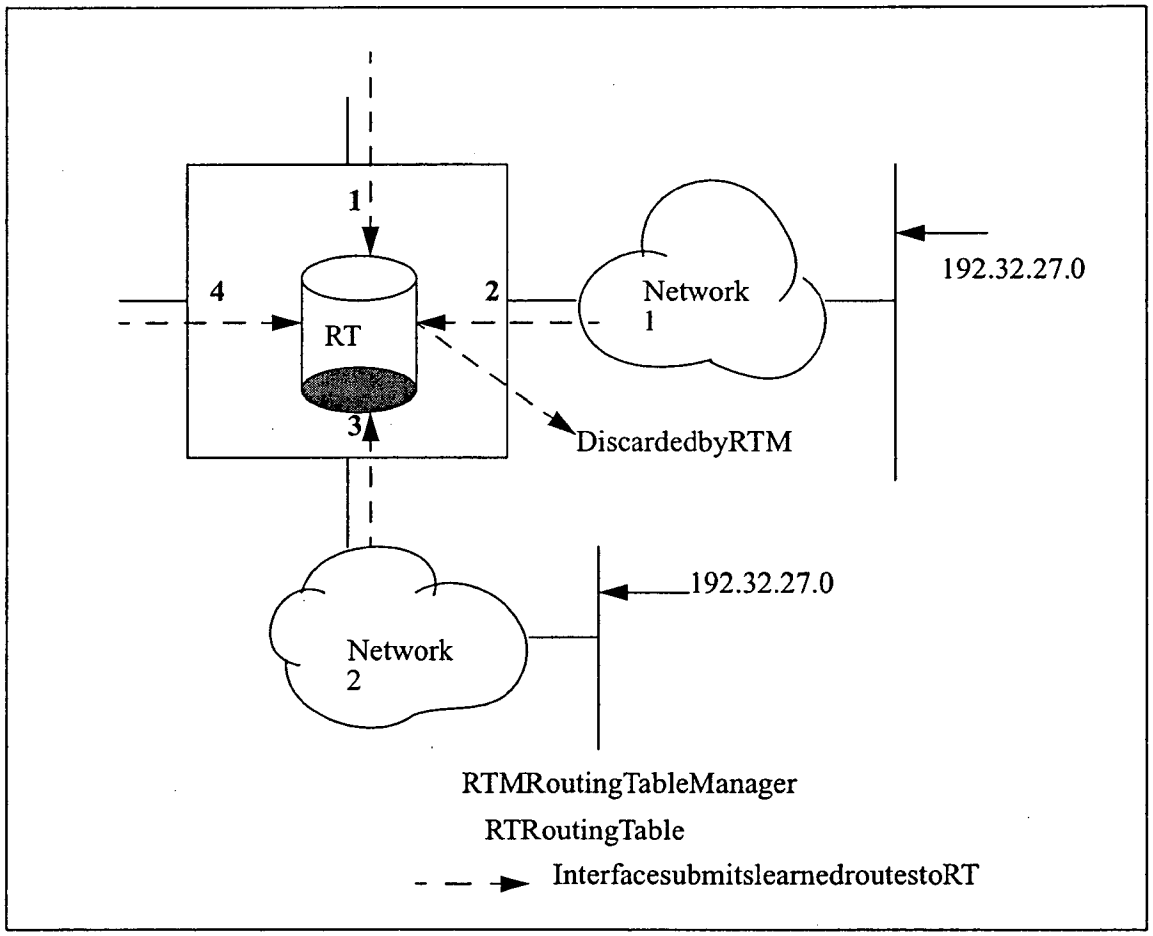
References:

[Ref.1] "MPLSVPNFunctionalSpecification",VPNManagersection,RichardCrump andJanetDoong.

Read and Understood: _____ **Print Signer's Name:**_____ **Date:**_____

Attachment1: TraditionalRouter.

The traditional router sees all interfaces as belonging to one address domain. In other words, all the routing addresses learned from different interfaces can't be duplicated or overlapped under the same routing protocol. The traditional router has only one routing table. All the routing protocols such as BGP, OSPF, RIP receive routes and submit to this routing table via a RoutingTableManagerforcentralrouteprocessingandcontrol.



For the above figure, interface 2 and 3 are connected to private Network 1 and 2, respectively. Interface 3 submits route 192.32.27.0 to the RT and later on interface 2 submit the same route to the RT. RTM will see that two interfaces somehow learned the same routing address. RTM will select the better route and discards the other one, even though these routes are represent twodifferentnetworks.

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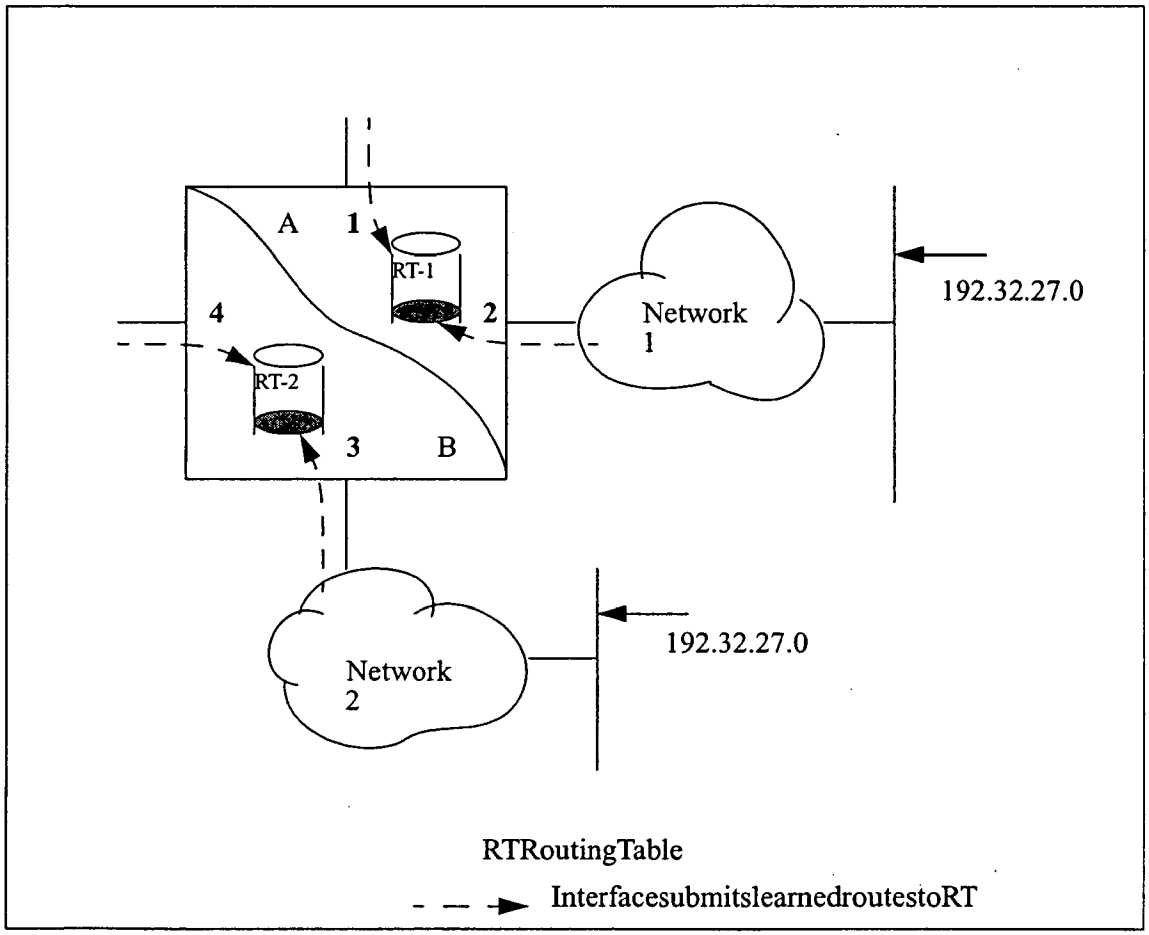
Attachment2: VirtualRouter.

The virtual router is virtually partitioned into several different routers within one physical router. Each individual router partition behaves as a traditional router and maintains its own IP stackandroutingtable.

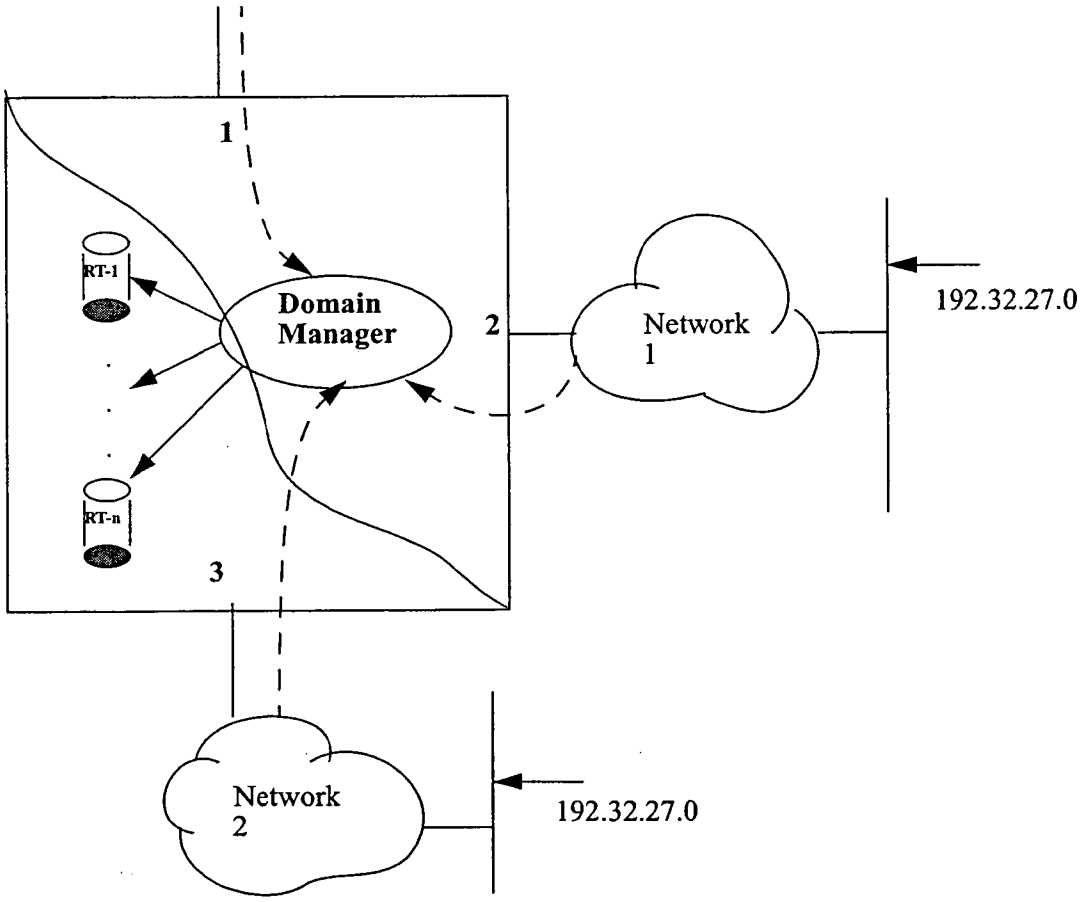


For the above figure, the router is partitioned into two virtual routers A and B. All the routes received and learned from interface 1 and 2 are submitted into RT-1 and the routes from interface 3 and 4 are submitted into RT-2. Route 192.32.27.0 received from interface 2 goes through its own IP stack process and is submitted into RT-1 in virtual router A. The same route received from interface 3 goes through virtual router B's IP stack process and is submitted into RT-2.Multiplestackstohandlemultipleroutingtableslimitsthevirtualrouter'sabilitytoscale.

Read and Understood: _____ **Print Signer's Name:**_____ **Date:**_____

Attachment3: RouterwithDomainManager.

Domain Manager provides a central control logic to dispatch routes from different interfaces to the proper domain specific routing table. Domain Manager solves not only traditional router's lack of support for multiple domains, but also resolves virtual routers' scalability problem byonlyrunningoneIPstackprocess.



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